

TECHNOLOGIES IN THE FIELD OF UNMANNED AERIAL VEHICLES: FROM PRINCIPLES OF OPERATION TO APPLICATION PERSPECTIVES

An examination of the current state of drone development reveals the broad perspectives and challenges they present to modern society and technological innovation.

Key components and operating principles of unmanned aerial vehicles: sensors, navigation systems, and control. These components and principles form the basis of drone operation, enabling their ability to perceive their environment, determine their position and route, and control their actions to accomplish tasks.

The role and importance of artificial intelligence in the development of unmanned aerial vehicles: autonomy and adaptability. Modern achievements allow drones to make autonomous decisions and adapt to changing environmental conditions.

Innovative methods for controlling drones: from routing algorithms to obstacle detection systems. These include the development of complex routing algorithms that determine the optimal path for drone flight, and the use of advanced obstacle detection systems to avoid collisions and maneuver safely in various conditions.

Safety and regulatory aspects of unmanned aerial vehicles. Analyzing challenges, such as potential threats to drone flight safety and privacy, and solutions to ensure safety and address regulatory issues.

Application of unmanned aerial vehicles in various sectors: geodesy and cartography, courier delivery and agrotechnologies. Use of drones for aerial photography and accurate mapping; in agriculture for field monitoring, fertilizer distribution and irrigation, helping to increase crop yields and production efficiency.

Development of drone technologies for search and rescue missions: optimization of response time and operational coordination. This involves the continuous improvement of systems to optimize response time and operational coordination. This means developing fast and accurate drones capable of quickly locating victims and transmitting this information to rescue teams.

Ecological aspects of the use of unmanned aerial vehicles: reducing emissions and minimizing environmental impact. Reducing emissions and minimizing environmental impact are key advantages of using drones compared to traditional aircraft or transportation.

Prospects for the development of drones include further improvement of their technical characteristics and functionality to achieve greater efficiency and expand their application possibilities.

Future research directions in the field of unmanned aerial vehicles include Improving artificial intelligence algorithms, developing new materials and designs, and using drones in harsh environments.